AMENDMENT TO THE CLAIMS

The following claims are presented for examination:

Claim 1: (currently amended) An apparatus comprising;

a ~~micromachined~~ pixel structure sensitive to incident low-level photonic radiation comprising;

~~-*~~a ~~planer~~ planar substrate; ~~covered with a patterned metallic mirror~~

a patterned metallic mirror disposed on the top surface of said planar substrate;

a platform connected to said planar substrate by at least one tetherbeam, said tetherbeam having low thermal conductivity, wherein said platform and said planar substrate are separated by an air gap, said air gap forming a first Fabry-Perot cavity having a spacing that substantially maximizes the absorption of incident low-level radiation; and

a pyro-optical film disposed on a surface of said platform, wherein said pyro-optical film has an optical transmissivity at the wavelength of an optical carrier beam that depends on the temperature of said pyro-optical film, and wherein said pyro-optical film defines a second Fabry-Perot cavity, wherein a thickness of said pyro-optical film substantially maximizes the thermal modulation index at the wavelength of said optical carrier beam.

~~* a platform formed above said mirror and substrate by the sacrificial etching away of an initially underlying film and with said platform connected to said substrate by means of tetherbeams of low thermal conductivity~~

~~*a pyro-optical film integral to said platform in which the optical transmission through the pyro-optical film for a topside-incident optical carrier beam is modulated by the platform temperature.~~

~~*said pyro-optical film of a controlled thickness so as to form a first Fabry-Perot structure which maximizes the thermal modulation index for said optical transmissivity~~

~~*said platform and underlying metallic mirrored substrate forming a second Fabry-Perot structure which maximizes the absorption of incident low-level radiation within the platform~~

Claim 2: (currently amended) The apparatus of claim 1 wherein said pixel structure further comprises an external photodetector, wherein said patterned metallic mirror contains

an opening that is aligned with said external photodetector. ~~The pixel structure of claim 1 with said patterned metallic mirror containing a transmission path permitting the topside optical carrier beam to pass through and into an external photodetector where the amplitude of the optical carrier beam is quantified.~~

Claim 3: (currently amended) The apparatus of claim 1 wherein said pixel structure further comprises a resistive heater. ~~The pixel structure of claim 1 where said platform contains a resistive heater element integral to said platform and with electrical interconnections formed within said tether beams and utilizing an external source of electrical power for the purpose of controlling the nominal temperature of said platform~~

Claim 4: (currently amended) The apparatus ~~pixel structure~~ of claim 1 wherein said pixel structure is arranged as a ~~one dimensional or two dimensional planer~~ planar array. ~~for the purpose of imaging the low level radiation.~~

Claim 5: (currently amended) The apparatus of claim 1 wherein said pixel structure further comprises:

means for periodically chopping incident low-level radiation; and

means for gating the amplitude of said optical carrier beam synchronously with said periodically chopped incident low-level radiation.

~~The pixel of claim 1 wherein incident, periodically chopped, low level radiation is absorbed in said platform causing it's temperature to fluctuate periodically and where the amplitude of the optical carrier beam detected by the photodetector is gated in synchronization with said chopped low level radiation for the purpose of increasing the signal to noise ratio of the detected low level radiation.~~

Claim 6: (currently amended) The apparatus of claim 5 wherein said pixel structure further comprises:

an electrostatic actuator for changing the thickness of said air gap; and

an external photodetector wherein said photodetector detects said optical carrier beam and is gated in synchronization with the movement of said electrostatic actuator. ~~The~~

~~pixel of claim 1 containing an electrode positioned above the substrate electrode to form an electrostatic actuator in which the platform is periodically moved between physical contact and no physical contact positions to provide positions of minimum thermal sensitivity and maximum thermal sensitivity, respectively, and where the optical carrier beam is detected by the external photodetector gated in synchronization with the movement of the electrostatic actuator for the purpose of increasing the signal to noise ratio of the detected low level radiation.~~

Claim 7: (currently amended) The apparatus of claim 6 wherein said pixel structure further comprises ~~pixel of claim 6 where the electrostatic actuation controlling the gap of the second Fabry Perot structure provides~~ means for tuning the infrared response over a selected spectral range by changing said air gap.

Claim 8: (currently amended) The apparatus of claim 3 ~~pixel of claim 2~~ wherein said pixel structure further comprises means for modulating the temperature of said platform in synchronization with a gating of an external detector. ~~where the heater current in said heater element is modulated to cause a thermal dithering and thermal cycling of the temperature of said platform in time synchronization with the gating of the external detector for the purpose of increasing the signal to noise ratio of the detected low level radiation.~~

Claim 9: (currently amended) The apparatus of claim 3 wherein said pixel structure further comprises means for causing said platform to contact said substrate such that said pixel structure is desensitized to low-level radiation.

~~The pixel of claim 2 where the heater element causes a periodic large deflection of the platform as a result of the difference in temperature coefficients of expansion in the bimorph tether beams in which the platform physically touches the underlying substrate for the purpose of desensitizing the pixel to low level radiation thereby eliminating the need for an external chopper.~~

Claim 10: (currently amended) The apparatus of claim 2 wherein said pixel structure further comprises means for modulating the amplitude of said optical carrier beam with a

periodic waveform such that response of said photodetector due to said carrier beam is gated in synchronization with the modulation of said carrier beam.

~~The pixel of claim 1 where the amplitude of the optical carrier beam is modulated with a periodic waveform and the carrier beam response in the photodetector is gated in synchronization with said optical beam modulation for the purpose of increasing the signal to noise ratio of the detected low level radiation.~~

Claim 11: (currently amended) The apparatus ~~pixel~~ of claim 1 ~~with~~ wherein said pixel structure further comprises a heater element, wherein said heater element is external to said platform ~~maintaining said substrate at a controlled nominal temperature~~.

Claim 12: (currently amended) The apparatus ~~structure~~ of claim 1 wherein said platform includes means for monitoring and controlling the temperature of said platform. ~~an integral thermister or pn junction serving as a temperature sensor with an electrical interconnect through the tether beams to external control circuits for the purpose of monitoring and controlling the temperature of said structure.~~

Claim 13: (currently amended) The apparatus ~~pixel~~ of claim 1 wherein ~~the~~ said pyro-optical film is an oxide of vanadium operated in the temperature range 55 to 75 deg C.

Claim 14: (currently amended) The apparatus ~~pixel~~ of claim1 further comprising an optical source of said optical carrier beam, said optical source further comprising at least one member chosen from the set consisting of filtered incandescent optical sources, gallium arsenide pn junction photosources, GaAsP pn junction photosources, GaN pn junction photosources, GaAlN pn junction photosources, and InGaN pn junction photosources.

~~where the source of the optical carrier beam includes one or more of filtered incandescent optical sources and pn junction photosources fabricated of gallium arsenide or gallium nitride or alloys thereof including GaAsP, GaAlN, and InGaN.~~

Claim 15: (currently amended) The apparatus ~~pixel~~ of claim 1 wherein ~~said sacrificial layer is polyimide and~~ said tetherbeams ~~include~~ comprises silicon dioxide.

Claim 16: (cancelled)

Claim 17: (currently amended) The apparatus ~~pixel~~ of ~~claim 1~~ claim 4 wherein said tetherbeam ~~arranged into an array with support posts of individual platforms~~ further comprises a support post shared by a tetherbeam of an adjacent pixels ~~thereby reducing the overall substrate area required and increasing the fill factor~~.

Claim 18: (currently amended) The apparatus ~~structure~~ of claim 1 ~~with said photodetector integrated into said planer planar substrate~~ wherein said substrate further comprises a photodetector.

Claim 19: (currently amended) The apparatus ~~structure~~ of claim 1 further comprising a ~~operated within a conventional~~ vacuum chamber enclosure, and wherein said pixel structure is contained within said vacuum chamber enclosure.

Claim 20: (cancelled)